Operations in Kosovo
In Search of the Optimal Deployment Method

Graduate Research Project

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Stephen J. Riley

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Abstract

The Army of today is being asked to deploy all over the world. The missions that the soldiers are asked to do are as diverse as the locations they deployed to. In the future, as the Army becomes a more lighter and leaner force, it will be asked to go more places and on shorter notices. However, it will be asked to deploy with the same level of lethality it did when it was a larger more robust force. Commanders need tools when asked to deploy forces. They need help when deciding quickly how to get their forces to the fight.

This thesis develops such a tool and applies it to operations in Kosovo. It provides a solution to the problem of what is the optimal European port to use when deploying forces to Kosovo. The tool use is an objective method that cancels out biases with facts and assumptions that pertain to the problem. It examines each course of action by comparing them to evaluation criteria. The criteria are derived from guidance from the Commanding General of both U.S. Army Europe and the 21st Theater Support Command.

The result of this study shows that Burgas, Bulgaria is the best course of action for deploying forces to Kosovo. It also explains that other factors that were not included in the study could have had an effect on the final recommendation. Overall, this study provides an unbiased answer to the question of which port to use for deploying forces to Kosovo and provides commanders a tool that will assist them when deploying forces in the future.

OPTIMAL DEPLOYMENT AND REDEPLOYMENT OF ARMY FORCES SUPPORTING OPERATIONS IN KOSOVO

I. INTRODUCTION

The Problem

What is the best way to deploy/redeploy forces to Kosovo from the European Central Region, or the Continental United States, or a combination of the two? Since 1999, the United States has had forces deployed to Kosovo in order to keep the peace in the unstable region. Since then, large forces have rotated in and out in many different fashions. Different modes of transportation have been used. Also, different routes through several different countries were used. Every rotation brought forth a different method of getting forces to where they were needed. Of course every method worked but is there an optimal way to get forces to Kosovo? The purpose of this research is to find the optimal way to deploy troops to that region using several evaluative criteria to include cost, time/distance, host nation support, force structure, railcar availability, port infrastructure, and force protection issues.

Forces have been successfully deployed and redeployed to Kosovo. So why conduct research on an issue that has already been done successfully? The reasons are simple: there is always a better way. Finding the optimal way to get forces to Kosovo will increase the efficiency and effectiveness of the Army Logistical System therefore making the Army more efficient and effective. By making the Army more efficient and effective will ultimately make the

Department of Defense a better organization. Throughout history, effective logistics has made the difference between victory and defeat and that is why improving the way we deploy units to Kosovo is an important issue and worth researching. Secondly, as U.S. Forces are asked more and more to deploy to troubled spots all over the world, finding a solution to the mobility problem in Kosovo could be used in future deployments as a template for successful deployments. Lastly, as the Army changes and evolves into a more lighter and leaner force, deployments will be expected to happen more rapidly. Having a deployment template will assist in the Armed Forces force projection future. My intent is to have the template I develop to be useful in future contingency scenarios.

Background

Force Projection is the Future of the Army

Throughout the world the United States Army is conducting force projection missions. Some of the better known missions included Kuwait, Sinai, Bosnia, and currently Kosovo. Since the Gulf War there are fewer and fewer permanently stationed U.S. forces in foreign countries that carry out a presence or a deterrence mission. The Army has become more CONUS based since the Gulf War but contingency missions in foreign countries such as Kosovo have grown by an astronomical rate. Therefore, each of these contingency missions involved the movement of huge amounts of Army Forces via different modes of transportation, usually over long distances, using many different airports and seaports. Because our forces are less permanently forward deployed as in the past, deploying forces to the fight has become an extremely difficult and critical task. Therefore, finding an optimal way to get troops in and out of Kosovo will possibly assist in future deployments making deployments more of a second nature mission. Every contingency

deployment in the future will have to take into consideration such issues as force protection, cost, host nation support, speed, and diplomatic country clearances. Therefore, studying Kosovo deployment options will be invaluable to future deploying forces.

Before tackling the problem of how best to deploy forces into and out of Kosovo, I will discuss how U.S. Army Forces were first deployed to the troubled region. Contingencies like Kosovo require certain military power. This portion of the paper will describe the composition of the forces needed in Kosovo and use it as an example of the force structure required in contingencies that the U.S. Army is called upon to conduct. With Kosovo force structure as the example, I will examine by what mode of transportation the force was moved and how long it took to move such a large, heavy force. I will discuss what was learned from that deployment: things that went well and things that needed improvement. Next, the paper will look into the future at what the Army will look like in years to come to offer insight into how the future force will deploy to contingencies throughout the world. Contingency missions, like the one in Kosovo, are more likely to be the missions of the future Army. Therefore, the Army must change as its mission changes, and it is. The Army is becoming a lighter, leaner force that is easier and quicker to deploy. In doing so, the Army is increasing its lethality by maintaining the level of firepower while at the same time decreasing the time it takes to get to the fight. With this lighter, quick response force, the Army hopes to get to the conflict quickly and put out the fire fast before it gets out of control. The rapidly deployable force will also serve as a deterrent to rogue nations who underestimate the "quick strike" capability of U.S. Ground Forces. The Army is not there yet, as seen during the Kosovo conflict. Later in this paper a list of evaluative criteria will be defined that all commanders should consider when deciding on how to deploy forces.

The Army's Deployments to Kosovo

There were certain military objectives in Kosovo. First, stop the Serb offensive attack on Kosovo. Second, force a withdrawal of Serbian Troops from the Kosovo Region. The U.S. Air Force accomplished those objectives through a highly successful air war. The Army did deploy Task Force (TF) Hawk to assist in the accomplishments of those objectives but were never employed into use. The Army's TF Hawk was created to provide a deep strike capability to compliment the Air Force bombers. An Apache (AH-64) Attack Helicopter Battalion and a Multiple Launch Rocket System (MLRS) Battery provided that deep strike Capability. The task force was not just 24 attach helicopters and a few rocket launchers. It was structured to defend itself and provide internal support due to the situation it faced. Challenges facing this task force included an austere and hostile environment with no infrastructure and it was constantly competing with the ongoing humanitarian effort. It was a Brigade size task force consisting of 14 M1A1 Main Battle Tanks, 42 M2 Bradley Fighting Vehicles, 12 various types of artillery, and 27 MLRS launchers. Over 190 containers of ammunition accompanied these weapon systems. Due to the lack of infrastructure TF Hawk also had to include a support element. The logistics package consisted of over 6,000 soldiers, 37 support aircraft, engineers, support units, life support, and over 2,000 pieces of equipment. Because of the size of TF Hawk it required a huge amount of airlift. From 8 April 1999 to 7 May 1999, 27 shiploads of equipment and supplies totaling 138,334 square feet and 6,762 short tons were moved. Also, the equivalent of 499 C17 aircraft missions were completed delivering over 22,978 short tons and 7,735 soldiers. The helicopters self deployed. However, this was not the entire element the Army was to send to Kosovo. This was only the deep strike portion of the force that already used nearly 500 C-17

equivalents. The larger force was to come later and require a great deal more air and sealift. As you can already see, getting the forces to the fight was a huge challenge due to the size of the force. If the leadership involved had a deployment template to work with it would have increased the efficiency of the deployment, saving both time and money.

Task Force Hawk Deployment Problems

It came at no surprise that the deployment of such a large element did not go smoothly or quickly. "Task Force Hawk found itself dogged by controversy before the first Apaches had even touched down in Albania, courtesy of a perceived sluggishness in deploying from Germany." The Pentagon announced the deployment on April 4, 1999. Initially it was anticipated that it would take up to 10 days to deploy the units. In actuality, the first Apache helicopter didn't land in Tirana until 17 days later. That was the first helicopter, not the whole task force.[1]

> The two-and-a-half week transit caused many journalist and armchair generals to heap criticism on the Apache force and, by extension, the Army's ability to get anywhere fast. Various news paper articles described the Army as "struggling" to deploy the task force, and quoted observers who were "mystified" about the cause of the delay.[2]

It would subsequently take weeks before the entire Task Force had arrived in Albania. Factors that contributed to the slow deployment included bad weather, the awful conditions of the Tirana airfield and political reservations both in the Pentagon and in NATO countries about whether to deploy such a task force. Other factors such as task force beddown location (Albania or Macedonia) were key issues. The airfield at Tirana was too small, and security issues and wet conditions all contributed to the slow deployment. But many argue that the gigantic size of such a specialized task force was the real reason to blame for the sluggish deployment. A smaller,

lighter force could have gotten there quicker and cheaper. The leaders also did not have a deployment template to work off from. If the commanders had previously laid out what exactly were their deployment priorities, not only in this contingency but in any peacekeeping mission, their subordinates could have reacted quicker. For instance, if the movement planners knew that port infrastructure was more important to the commander than cost, they could have used that information to find an optimal port to deploy to.

Air War Concluded—Bring in the Peacekeepers

TF Hawk and the U.S. Air Force were not the only American Forces that were needed in Kosovo. There were more objectives in the Kosovo campaign. The third objective was to establish a NATO led international peacekeeping force in Kosovo. In doing so, accomplishing the fourth objective: Allow the safe and peaceful return of Kosovar Albanian refugees. Following the conclusion of the air war, it became apparent that the establishment of a NATO led peacekeeping force should be done quickly.

TF Falcon was the US KFOR contingent for NATO Operation Joint Guardian to accomplish the last two objectives. Its purpose was to monitor, verify and enforce as necessary the provisions of the Military Technical Agreement to create a safe and secure environment. It was to provide humanitarian assistance in support of UNHCR efforts. Lastly, it was to initially enforce basic law and order and establish/support resumption of core civil functions.[3] The deployment of TF Falcon commenced on 11 June 1999. It was a multi-modal deployment (air, sea, ground, and helicopter self-deployment). The Army deployed forces via ground and air from Albania and from Germany via air and sea. This subsequent deployment included two light infantry companies and its battalion headquarters of the 505th Infantry Regiment, 11 additional

Apache helicopter crews from the 11th Aviation Regiment and logistics support personnel from the XVIII Airborne Corps. These units came all the way from Fort Bragg, NC. More units deployed, including a light infantry company, an MLRS platoon, an antitank platoon, a military police platoon, an armor company, a 155-millimeter artillery battery, combat and construction engineer companies, air defense battery units, chemical units, logistics vessels from the 7th Transportation Group in Fort Eustis, VA, and several combat service support units from both the United States and Europe.[4] A total of 51 trains carrying 23,480 short tons were used. Five vessels including two Large Medium Speed Roll-on Roll-off ships (LMSR) carried 571,562 square feet of cargo and equipment weighing 28,763 tons. The critical air piece totaled 299 aircraft missions hauling 13,419 short tons and 6,908 passengers. The deployment faced many problems. Greece limited the speed of the deployment through its country by allowing only 300 NATO vehicles per day. The deployment was further slowed by Greece's insistence that convoys could be conducted only at night. The port of Thessaloniki, Greece could only berth one of the two LMSRs at one time because of the lack of pier space and the shallow waters in the port. The LMSRs draw approximately 35 feet of water when fully loaded. These restrictions severely slowed the flow of forces into Kosovo. Also, because of the high threat of terrorism in Greece, force protection was a serious issue.

The Size of the Deployed Force Caused Throughput Problems

But are these infrastructure restrictions in Greece, Albania, Macedonia, and Kosovo to blame for all the problems that happen during this deployment and the deployment of TF Hawk? One could argue that the real problem stemmed from the size of the deploying force. The forces are just too big and heavy to be easily moved throughout many parts of the world. The Military

Traffic Management Command is the Army's traffic manager and is charged with the Reception, Staging, Onward movement, and Integration (RSOI) of the force. They are the Army's movement experts. They had begun planning for the Kosovo Campaign in October of 1998, eight months before execution. Even with eight months of planning, the Army's experts in mobility continually ran into problem after problem with the deployment of forces to the troubled region. For instance, even though Greece had several restrictions including convoy size, the times convoys could run, and the port of Thessaloniki being able to only berth one large ship at a time, after surveying several ports, it was still considered the best option. Without a contingency deployment template it made it very difficult to plan and execute such a large mission. The massive size of the deploying force coupled with the restrictive infrastructure of the region forced MTMC to pick a less than optimal solution to the RSOI problem in Kosovo. One of the only ways the Army made up crucial time was when they deployed the 1st of the 35th Armored Regiment, 1st Armored Division by air on 13 June 1999. The Army deployed three light airborne companies with one tank company and one mechanized infantry company. If the planners specifically knew the commanders' deployment priorities ahead of time and had a template to work with, the deployment would have probably been much easier and efficient.

The Lighter, Leaner Army—Deployed fast, Self-supporting

The Army recognized this dilemma. The Army has realized that, "In many military interventions to deter or thwart an invader entering a country friendly to the United States, The United States would benefit greatly from being able to employ-within days rather than weeks-a joint task force that would combine long-range fires from aircraft and missiles with maneuver forces on the ground."[5] As seen in Kosovo, long-range fires proved to be enough to drive

Serbian Forces out of Kosovo, but if a ground maneuver force did exist, and was suitable for the circumstances, it might greatly enhance the Air Forces' long-range firepower. They might be able to cause further disruption and damage to the enemies, and be employed if the long-range firepower failed.

> They could be especially valuable for conflicts in mixed terrain, and in conflicts in which they linked up with significant friendly forces. They could be quite useful in smaller-scale contingencies as well as major wars. For example, had such forces existed in 1999, more options would have been available to NATO's political leaders in the early stages of the Kosovo operation.[6]

The new Army force to accomplish this mission is the Brigade Combat Team (BCT). GEN Shinseki's, Army Chief of Staff, vision is to make the heavy force lighter, more mobile, more lethal, and more survivable. There will no longer be a distinction between the heavy, medium, and light Army combat forces. The BCT will be the new force and will be more strategically responsive to meeting the CINCs' requirements. Of course the Army will not mothball all of its heavy equipment like the M1A1 Abrams Main Battle Tank or the M2 Bradley Fighting Vehicle. Those weapon systems will still be needed in larger scale conflicts in terrain that would suit them. But to rapidly move an M1A1 Abrams it requires an entire C-17. The new BCT would be equipped with lighter, wheeled armor vehicles where four to six of them could fit in the belly of a C-17. It would bring more firepower to the fight, quicker, and require a lot less lift. Even though the new lighter, leaner Army could be deployed in a more versatile manner, a standard template of evaluative criteria like cost and force protection could still be used effectively in the deployment decision-making process. Since the end of the cold war, we have seen more conflicts like Kosovo that are smaller scale contingencies with missions to provide stability and support. The new force being created will be the optimal force structure for those types of conflicts.

One of the key elements of the BCT is it must be able to deploy rapidly. GEN Shinseki's goal of 96 hours from the wheels-up of the first plane. The 96 hours start when the unit gets the order to deploy. It continues through the entire unit deploying by aircraft until the last portion of the unit lands at destination. This will not be an administrative move that requires more time before the unit is ready to fight once it arrives in theater. The BCT will be combat capable upon arrival. For the BCT to be able to deploy rapidly, GEN Shinseki requires that everything in this brigade must be able to fit in a C-130 Hercules. "If it doesn't fit in a C-130, it doesn't go into the brigade. That's a key parameter."[7] The BCT will rely heavily on reach back both for logistics support and intelligence. When the BCT needs something it will "reach back" to non-deployed units for support. For the BCT to be deployable in 96 hours it must reduce its footprint forward. The smaller the footprint the smaller the lift capability needed to move the force and its decreased size lends itself more to flexibility and mobility on the ground. Bottomline: the new BCT will do well in small scale contingencies like Kosovo, deploy rapidly, offer deterrence, contain the situation or shape the situation and resolve the problem of force. The key element is its ability to deploy rapidly by air and meet the Chief of Staff of the Army's goal of closing on the fight in 96 hours.

No matter what size force is needed for the operation, it will have to be moved, most likely in the most rapid way possible. By examining the Kosovo deployment problem, I hope to find a solution that can be applied to any contingency mission that American Forces are called on to perform.

II. LITERATURE REVIEW

Most of the literature review for this research paper has come from the 21st Theater Support Command located in Kaiserslautern, Germany. Other information that I have reviewed pertained to the history of the conflict in Kosovo. As seen in the beginning portion of the bibliography, most of the sources deal with prior deployments to Kosovo. They talk about problems with those deployments and the difficulty with logistics in general. The literature also went into depth about the new lighter, leaner Army and how necessary that is as the Army becomes more of a force projection force.

The biggest source of information that I will reference will be a briefing build by Ken Crawford of the 21st TSC Support Operations Division, Plans section. The background information that went into that brief will also be a big source of information for my studies. Mr. Ken Crawford and his staff, along with other subordinate units under the 21st TSC, have put together a comprehensive look at options, or courses of action, for deploying forces to Kosovo. These courses of action have been evaluated by certain criteria deemed important by the commander of the 21st TSC, MG Hack. These evaluation criteria are the constructs I will use to examine each course of action. The constructs/criteria are mentioned briefly in chapter three, research method, and more thoroughly explained in chapter four, analysis. Also in chapter four new constructs will be introduced and the COAs will then be compared using these new criteria.

A great deal of the information that will be used for this paper is personnel interaction with people working on this project over in Germany. I have conducted several phone conversations with Mr. Ken Crawford and other members of the 21st TSC in reference to this research project. Because Mr. Crawford and most of the people working on this project are in Kaiserslautern,

Germany, the bulk of our communication has been electronic mail. I have conducted most of the face-to-face interviews with people in Germany when I traveled there in May.

Mr. Crawford is currently gathering the background information that went into making his brief. Unfortunately, there have been limited studies down in the past of this topic to review. Therefore my literature review is confined to background information on the previous Kosovo deployments, the 21st TSC power point briefing, the background information that was used to make the briefing, personal interviews, both telephonic and face-to-face, and electronic mail.

III. RESEARCH METHOD

The method I will use for this research project will be a combination of the qualitative research method and the quantitative research method. Using both research methods will yield different perspectives and look at the problem in two different ways, hopefully adding depth to the study.

Using the qualitative research method, I will gather and analyze this research by examining historical data from several different sources. I will look at after-action reports from the actual units that deployed. I will also conduct interviews with my sponsor in the 21st Theater Support Command (TSC), Mr. Ken Crawford, to find out what are the most important variables or criteria to the Commander, MG Richard Hack. His intent will allow for weights to be placed on each variable, which is necessary in coming up with an optimal solution to this problem. I will also interview other members of the United States Army Europe (USAREUR) and individuals of units that have deployed in and out of Kosovo in order to gain their perspective on the problem. The interviews will be conducted via email, telephone, and face-to-face when I go to Europe in May. At that time I will conduct extensive face-to-face interviews and meet with people involved in the deployments to Kosovo.

Secondly, I will use the quantitative research method. I will examine data like cost analyses developed by the 21st Theater Support Command, Kaiserslautern, Germany. I will also examine time and distance data and I will look at port surveys developed by the 1st Theater Movement Control Agency, a subordinate unit of the 21st TSC also in Kaiserslautern, Germany in order to examine the capabilities of both air and sea ports.

Using both methods, I will closely examine constructs/criteria developed by the 21st TSC. Examining these constructs will be key in solving the problem on what is the best way to deploy units to Kosovo. The 21st TCS has narrowed potential deployment courses of actions down to four options. The options include deploying/redeploying forces through Bremerhaven, Germany; Thessaloniki, Greece; Constantza, Romania; and Burgas, Bulgaria. At this time I will briefly explain each construct. Each construct is an evaluation criterion that the commanding general of the 21st TSC, with guidance from the commanding general of USAREUR, has deemed important in deploying forces to Kosovo and will be used in comparing the different courses of action.

The first construct is Time/Distance which is roughly defined as how long it will take cargo to get to the port or ports of debarkation and then onward moved from their to the destination location. The second construct is Force Protection/Security, which is defined as the ability to protect the force and equipment from outside threats (terrorism, crime). The third construct or evaluative criteria is Force structure and that is defined as the number of personnel required to conduct a safe and timely Reception, Staging, and Onward movement (RSO) operation. Port Infrastructure is the fourth construct. It is defined as the ability of the port chosen to handle containers, rolling stock, staging, and its availability of Mechanized Handling Equipment (MHE) and Container Handling Equipment (CHE). The fifth construct is Railcar Availability and is defined as the correct types and number of railcars that a host nation is able to provide or procure to onward move the equipment from the port. The sixth construct is Life Support, defined as the ability to provide safe life support for U.S. Forces. Host Nation is the seventh construct and is defined as the ability of the host nation governmental or commercial activities to augment the capabilities either with personnel, services or equipment. The final construct is cost. Cost is

defined as the total cost of shipping, establishing a RSO site and the cost of onward moving the equipment from the port.

All of these constructs or evaluation criteria will be considered in deciding what the best option is in deploying and redeploying forces into and out of Kosovo. They will be more thoroughly explained in chapter four. These constructs encompass both the qualitative and quantitative research methods and will be provide depth to the project.

Additional evaluation criteria will be introduced in chapter four. These criteria were developed through new guidance from the commanding generals of both the 21st TSC and of USAREUR.

IV. ANALYSIS

The 21st TSC is responsible for the movement of all Army cargo, equipment, and personnel throughout the European area of operation. Operations in Kosovo fall under there area of responsibility. Previously the 21st TSC decided the best way to get soldiers and their equipment to Kosovo was by utilizing the port of Thessaloniki, Greece and the German port at Bremerhaven. Due to the movement restrictions and force protection issues with Greece and the length of the Rail Lines of Communications (LOC) from Bremerhaven to Kosovo, a requirement existed to locate an alternate SPOE/D for CONUS and OCONUS units.

This chapter will discuss how an optimal solution for this problem was found. I will use the decision making process as an outline to follow. First I will discuss the facts bearing on the problem and then discuss the assumptions that are made in this situation. I will then discuss the different Courses of Actions (COAs) available to the 21st TSC. The COAs will be compared against certain evaluation criteria. The evaluation criteria will be used to closely compare the remaining COAs. The evaluation criteria will have certain weights associated with them based on the level of important the commanders of USAREUR and of the 21st TSC decided. The COAs will be closely analyzed and compared against each other. This chapter will conclude with a decision matrix that provides a numeric value to each COA. The COA with the lowest value will be the one chosen. By using a decision matrix, subjectivity is eliminated yielding a more honest and scientific result. Also, if the commander of the 21st or any other commander later decides that the order of importance for the evaluation criteria has changed, the decision matrix can be easily changed to facilitate the change.

Facts Bearing on the Problem

Before we can dive right into solving this problem of what is the best port, or what way is the best to get the Army to Kosovo, we must first look at important facts that impact this issue. The first facts we will look at are the cost of previous deployments to Kosovo. The first Kosovo deployment cost $11.6 million.[8] This deployment consisted of shipping equipment out of Central Region, Germany through the port of Bremerhaven to Thessaloniki, Greece. The second Kosovo deployment cost $15.8 million.[9] This deployment consisted of shipping equipment via rail from Central Region, Germany to Macedonia and Kosovo. The next deployment to Kosovo will be a CONUS based unit whose SPOE will be Charleston, South Carolina. MTMC cost will be the same no matter what European port is used for the rotation. However, MSC's cost will increase as the Sea Lines of Communication (SLOC) increase. MSC shipping cost are $45,000/day.[10]

When selecting a port to use for the rotation strong consideration must be given to Bremerhaven and Thessaloniki because both are proven ports. If other ports are considered, they must be examined closely to insure they are quality facilities.

Another important fact concerning the selection of ports is the fact that if Bremerhaven is chosen the rail route from Bremerhaven goes from Germany through Austria, Hungary, Romania, Bulgaria, Greece, and Macedonia, into Kosovo.[11] It is a proven and reliable Ground Lines of Communication (GLOC). The rail networks from Thessaloniki and other Black Sea Ports to Kosovo have not been used yet so their reliability is questionable. Routes through Serbia are established but are not yet available to NATO nations. 1st TMCA is currently looking into using Serbia as a possibility for rail movements.[12]

The German Deutch Bahn has assured the 21st TSC that they will have sufficient amount of rail cars needed to rail the entire unit to Kosovo whether they rail all the way from Bremerhaven or rail from a port closer to Kosovo.

Montreux Convention restrictions will apply for this rotation of units. The Montreux Convention was an agreement signed in 1937 by European Nations restricting the amount of military vessels and or vessels carrying military equipment allowed to enter the Black Sea.[13] It was an agreement pushed by Turkey. Although the U.S. was not a consignee, we abide by the agreement. Military Sealift Command (MSC) does not see this as an issue because there has been no resistance from Turkey or Russia.[14]

Concerning Greece, terrorists within Greece historically operate in Athens. Another important fact concerning possible operations in Greece is that Greece has imposed blackouts on three different occasions. These blackouts have seriously affected operations in the port of Thessaloniki.[15]

Assumptions

There are several assumptions that were made concerning this issue. These assumptions are based on facts and earlier deployment experiences in Kosovo and the Balkan region in general.

One of the biggest assumptions is that the United States will gain host nation approval to use ports in all nations that have the ports that are being looked at. This has not been an issue in the region because of the economic situation of those countries. All the countries in the Balkan area are in dire need of business to bolster their economies. Another assumption based on economics is that the host nation will augment security, medical and life support needs.[16] These nations are looking to not only improve their economic situation but also position themselves for possible

future membership in the United Nations. Cooperation with the United States could only improve their chances of membership.

The KFOR 2B/3A redeployment/deployment cycle will consist of approximately 1,500 pieces of equipment. Based on that assumption, it is also assumed that a medium RO/RO ship will be used for this KFOR rotation of CONUS units. Another assumption is the CONUS SPOE will be Charleston, SC and the rotation of units will occur in the May-June 2001 timeframe.[17]

Courses of Action

From the facts bearing on the problem along with the assumptions derived from them and previous experience in the European Region, five courses of action were examined in an effort to find the optimal port of debarkation for operations in Kosovo. Potential ports looked at by the 21st TSC were Bremerhaven, Germany; Thessaloniki, Greece; Constantza, Romania; Burgas, Bulgaria; Varna East and West, Bulgaria. Obviously there are many other ports and routes that could be used to support operations in Kosovo but the scope was reduced to these courses of action due to political circumstances of the countries, past experience using these ports, and their proximity to Kosovo. I will now more closely examine each course of action.

Figure 1-Bremerhaven, Germany

COA 1: Bremerhaven, Germany

Bremerhaven was an obvious choice for units rotating to Kosovo from the United States. It has been used since 1995 when units began to deploy to Bosnia. It is one of the most used and reliable ports for the U.S. Army in Europe.

Port Infrastructure

Bremerhaven has a robust port infrastructure. It is capable of simultaneously working two LMSR/FSS size ships. It has a huge staging area of over 20,0000 square feet. The port has a robust rail network. Several rail lines lead into the port. There is a double ramp located only 100 meters from the ship berths and an additional five concrete ramps available if needed.[18]

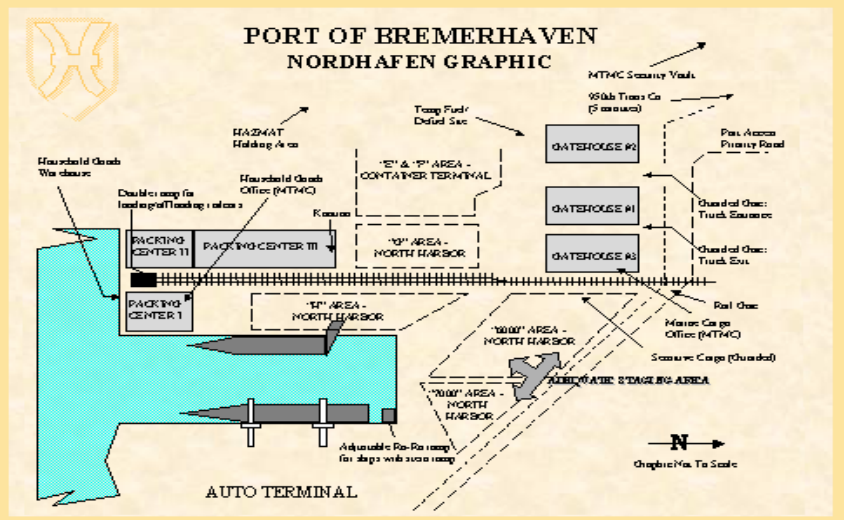

Figure 2-Port of Bremerhaven

Time and Distance

Bremerhaven is located in Northern Germany. The distance from the Continental United States by sea (referred to as Sea Lines of Communication, SLOC) is 4,032 miles with an estimated travel time of 11 days. With the amount of equipment expected for the rotation, it would take two days to download and stage the equipment from the ship. It would take an additional one day to upload the equipment on rail cars. From there it would take approximately 144 hours, or six days, to reach its destination in Camp Able Sentry, Macedonia. The distance by rail (Ground Lines of Communication) is 1,984 miles. There are six border crossings, which require four hours each to complete. Therefore, the total travel time would be estimated at 21 days.[19]

Force Protection, Force Structure, and Life Support

Because Bremerhaven is located in Germany the force protection requirements are minimal. It is also a very robust, commercial port requiring a very small military force structure element. Most of the work could be contracted out to the local labor force. However, some military presence would be required and Bremerhaven is well suited to accommodate almost any size military unit. It is a modern city with many hotels, Gausthaus, and restaurants.

Host Nation Support

Another major plus to using Bremerhaven is the history of outstanding host nation support that has been provided to the United States from Germany for over 50 years. Germany has proven it can be relied on.

Cost

All of the high quality attributes of Bremerhaven including the modern, robust port infrastructure, skilled workforce, and ample life support do come at a price. The total port and Life Support Activity (LSA) cost total approximately $15,477,940.[20] These cost include both the deployment and redeployment of forces.

COA 2, Thessaloniki, Greece

Thessaloniki, Greece was the first port used by the U.S. for deploying forces to Kosovo. It is an excellent facility, but difficulty working with the Greek Government along with force protection issues have forced the 21st TSC and USAREUR to look elsewhere.

Figure 3-Thessaloniki, Greece

Port Infrastructure

Thessaloniki is an excellent port. Its largest pier, pier six, is 1,640 ft long with a draft of 39 ft well suited for an LMSR or a FSS. It has ample staging area for convoys and an excellent container terminal large and modern enough to handle even the largest of rotational units. Its rail system is adequate having both side and end loading ramps available on site. The one concern with rail is not infrastructure but availability. In previous rotations, Greece has had some difficulty obtaining enough railcars to support the large amount of vehicles and equipment the U.S. typically rotates in and out when units deploy and redeploy from Kosovo.[21]

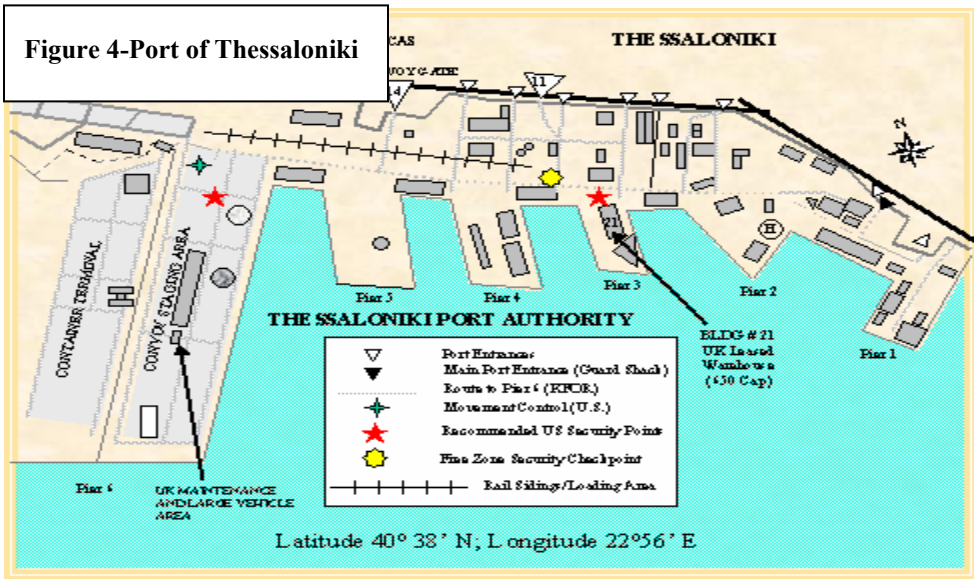

Figure 4-Port of Thessaloniki

Time and Distance

Because Thessaloniki is located in the Mediterranean Sea, it will take longer to reach from U.S. ports. The SLOC is 5,329 miles with an estimated travel time of 15 days.[22] Having a similar port capability as Bremerhaven, it would take two days to download the ship and one day to load the equipment on either rail or trucks. Trucks would be the most likely mode of transportation because of the unreliable railcar availability and the relatively short distance by road. The distance from Thessaloniki to Skopje, Macedonia is only 141 highway miles, with an

estimated travel time of six hours and 30 minutes. The total estimated transit time from the SPOE to Camp Able Sentry is 18.5 days.[23]

Force Protection, Force Structure, and Life Support

One of the biggest problems U.S. Forces encountered when they used Thessaloniki for the first deployment to Kosovo was the high force protection requirement. Greece has always been a volatile country because of its high terrorist activities. Also, property crime has always been an issue because of the economic instability of Greece. Because of that, the force structure would have to be robust. A lot more soldiers, especially security/military police, are necessary to offset the danger of terrorist and crime activities. Life support is adequate at the port. Building 21 is a British controlled facility on the port and could be used for some life support activities. Also, Sindoes Military Kaserne is located nearby and has also been used for LSA. Thessaloniki is a modern city with many of the same resources as Bremerhaven, which improves its LSA capabilities.[24]

Host Nation Support

Host Nation Support in Greece is adequate but problems have occurred in past deployments. There have been problems concerning occasional border crossing and custom related activities. These combined make using Thessaloniki for rotation of U.S. Forces a liability.

Cost

Costs of using Thessaloniki are high. The total cost of both the deployment and redeployment, and the LSA costs on both ends total $10,345,812.[25]

COA 3: Burgas, Bulgaria

The port in Burgas, Bulgaria was one of the ports looked at in the Black Sea. The commander of USAREUR, GEN Meigs, wanted to increase the options available to forces in

Europe to increase the military's presence throughout the Theater and to decrease the predictability of our operations. Basically, the more options available in the Theater the less likely our enemies would be able to predict our movement. Therefore, GEN Meigs' desire to increase the military theater presence prompted the 21st TSC to look at Burgas and other seaports in the Black Sea.

Figure 5-Burgas, Bulgaria

Port Infrastructure

The port facilities are very good at Burgas. It has sufficient open staging areas for the staging of equipment and it also has covered storage facilities. These covered storage facilities are extremely important for helicopter operations. This allows the helicopters to be assembled under cover before they are onward moved to the nearby airport. There they could stage and fly out in groups of six to U.S. Camps in Macedonia and Kosovo.[26]

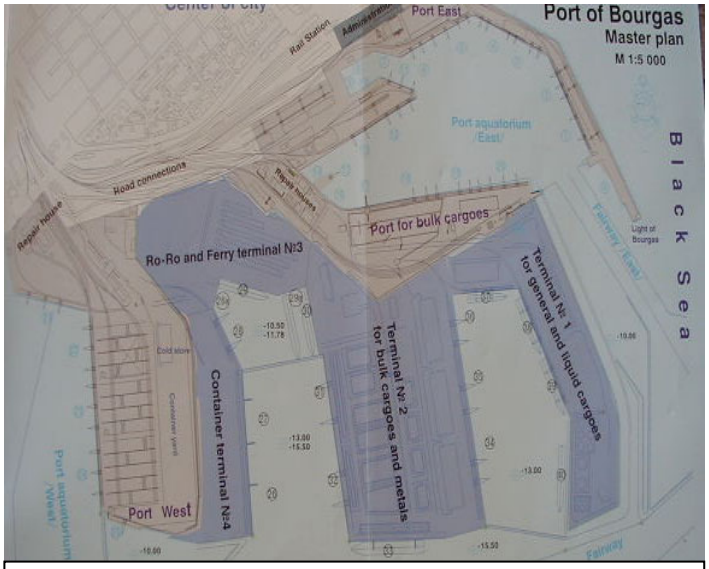

Figure 6-Port of Burgas

The rail facilities at the port are adequate. The rail yard has a side ramp on-site to facilitate the loading and unloaded of equipment but does not have an end ramp. Therefore it would be necessary to bring the portable end ramp in order to increase the speed of the operation.

The port rail yard does connect with the national rail network of Bulgaria. However, rail is an issue in Bulgaria. Bulgaria has a shortage of railcars and probably would not be able to support the massive requirements of a KFOR rotation. Therefore, the German Deutch Bahn (DB) would have to assist and supply railcars from central regions. The DB has resisted these ideas because it is not cost affective to send railcars down to Bulgaria for a relatively small shipment of equipment.

The one instance that the DB helped was in April 2001. In the small town of Radomir, Bulgaria, located approximately 45 minutes Southwest of Sofia, tanks loaded on DB leased railcars from Central Region were downloaded and loaded on Heavy Equipment Transports (HETs). From there they road marched 200 KM to Camp Able Sentry, Macedonia. The tanks were transshipped at that location because of the weight and size restrictions of the rail network in Bulgaria. The operation at Radomir was a huge success. The Bulgarian Government was very supportive and proved their resolve to support NATO forces in the region.[27]

One major drawback with the Port of Burgas is it is incapable of supporting a large vessel such as an LMSR or an FSS due to the tight turning radius in the basin and the shallow draft of the port. Therefore, medium sized RO/RO commercial vessels would be needed to transport KFOR equipment to the port.

Time and Distance

To reach the Port of Burgas by sea from the Continental United States, a ship must cross the Atlantic Ocean, travel through the Mediterranean Sea, through the Turkish Straits, then into the Black Sea. The SLOC is approximately 5,554 miles with a travel time of 15 days. The equipment could be downloaded in two days and uploaded on rail in one day. The GLOC from Burgas to Camp Able Sentry, Macedonia is 633 miles. The equipment would go by train taking

35 hours, approximately one and one-half days. This route has two border crossings, first Bulgaria-Greece, then Greece-Macedonia. Each border crossing takes about four hours, with a total of eight hours of border crossing time. The total estimated transit time from the port of Charleston, SC, through the port of Burgas, to Camp Able Sentry, Macedonia is 19.5 days.[28]

Force Protection, Force Structure, and Life Support

Although U.S. Forces have not previously used the port, the threat assessment was determined to be as safe as Bremerhaven. One major benefit of using Burgas is that military operations and commercial operations could be separated. This separation allows for closer monitoring of activities and reduces both the threats of terrorism and theft. The separation is a major force protection advantage.

Because of the low threat assessment and the ability to separate commercial and military port operations the force structure needed to run operations in Burgas is small to medium. Not nearly as many security personnel would be required as compared to Thessaloniki.

LSA requirements would also be reduced because of the reduced size of the force structure. Also, the Bulgarian Government offered the use of a military resort hotel complex only five km from the commercial airport and 14 km from the port.[29]

Host Nation Support

The host nation support provided by Bulgaria has been outstanding. They have continuously looked for ways to provide better support to KFOR forces. One of the most significant efforts put forth by the Bulgarian Government was their establishment of the National Logistic Coordination Center in 1999. The Bulgarian Government established this organization in Sofia in order to provide better support for KFOR movements through their country. Basically it is a one-stop shop for all coordination with the Bulgarian Government. It is the single POC for all

agencies in Bulgaria making it much easier to coordinate operations. It has been highly successful especially with the operations in Radomir.

Being a former communist nation, the Bulgarian Government does not always see eye-to-eye with western nations including the U.S. However, they have been increasingly willing to go along with U.S. recommendations concerning the movement of KFOR equipment throughout their country.

Cost

The total estimated cost for using Burgas for the rotation of KFOR equipment is $11,376,300.[30] The biggest portion of the cost comes from MSC shipping fees. The fees were high because it was difficult for MSC to contract a tender for commercial vessels because there are not very many commercial ships that transit the Black Sea in comparison to the Mediterranean and other major European seaports. The other major contributor to the cost of using Burgas is the onward movement cost. Because there are not enough railcars in Bulgaria, additional railcars are required to be sent from Germany. The DB charges very high rates for using their railcars. In the future they may be unwilling to even supply the railcars if they think they can make more money by keeping the railcars in Central Europe.

COA 4: Constantza, Romania

Another port on the Black Sea that is a good initial candidate was the port of Constantza, Romania. Being a Black Sea port it has similar advantages to using Burgas, Bulgaria. It also increases U.S. presence throughout the European Theater and, if used, increases overall force

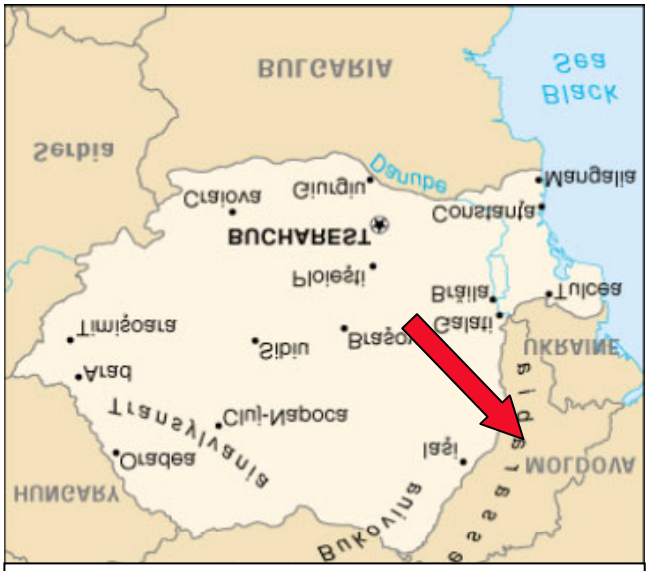

Figure 7-Constantza, Romania

protection by expanding the options available to USAREUR for deploying and redeploying forces in Theater. However, there are serious disadvantages to using Constantza, which eliminates it from serious consideration as a possible course of action.

Port Infrastructure

Constantza is the largest port on the Black Sea. Because it is the largest port it is very busy. It has the capability to easily handle an LMSR or an FSS. The RO/RO pier is 214 meters in length with a draft of 13.2 meters. Constantza has a very large staging area and ample warehouse space available. Constantza's rail yard connects to the national rail network. It has both side and end ramps available on-site, which increasing the speed and options for loading and downloading railcars.[31]

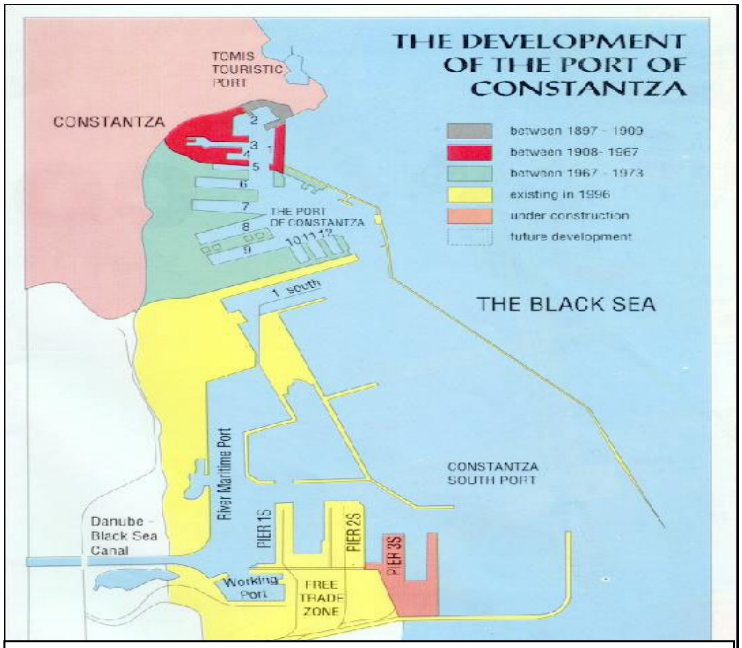

Figure 8-Port of Constantza

Time and Distance

Constantza is located in Eastern Romania on the Black Sea. Romania is bordered in the south by Bulgaria making it a little longer to get to by sea than Burgas. The distance from Charleston, SC to the Port of Constantza is approximately 5,733 miles by Sea with a traveling time of 16 days. It would take about two days to download cargo and equipment and one day to upload cargo and equipment onto a train. From the port it is approximately 812 miles by train with a travel time of 45 hours. There are three border crossings: Romania-Bulgaria, Bulgaria-Greece,

and Greece-Macedonia. Each border crossing takes an estimated four hours making cumulative border crossing time of 12 hours. The total estimated transit time from Charleston, SC to Camp Able Sentry, Macedonia using the Port of Constantza is 21.5 days.[32]

Force Protection, Force Structure, and Life Support

Constantza has similar force protection levels as Burgas. They are both considered to be nearly as safe as Bremerhaven with little or no terrorist activity in either country. However, being a former eastern block, communist nation, economic conditions are not optimal. Therefore the threat of property crime is set at medium. Also, Constantza is a much busier port than Burgas, which could create force protection issues. Force structure requirements were estimated to be about the same as Burgas except for a possible increase in security forces due to the busyness of the port. With that, the LSA requirements would be about the same or maybe a little larger than Burgas.

Host Nation Support

Romania has not proven to be as good a host nation as Bulgaria. One example is the way they handle security at the port. Romania demanded to be paid for providing port security forces while Bulgaria offered the same service free of charge. Romania has a tendency to nickel and dime NATO forces. With that, 1st TMCA has had a bad working relationship with Romania.[33]

Cost

Although exact cost figures are not available for using Constantza, I assume they would be slightly higher than Burgas for several reasons. First, both the SLOC and the GLOC are longer therefore increasing shipping cost by sea and by rail. Also there are more border crossings, which require military police security to prevent pilferage. Lastly, the Romanian Government's

tendency to constantly nickel and dime their NATO customer would increase total cost to the operation if Constantza was chosen as the primary course of action.

COA 5 Varna, Bulgaria

Lastly, the port of Varna, Bulgaria was looked at as an additional possibility for a Black Sea port. It is located just north of Burgas. Like Burgas, using Varna would increase the theater presence of NATO forces throughout the European Theater.

Port Infrastructure

The facilities at Varna actually consist of two ports: Varna West and Varna East. Varna West is the newer of the two facilities with considerable hard space for staging equipment. However, it does not have any covered space to assemble helicopters. To reach the port one must traverse a 20 km channel inland. The channel is heavily traveled and it has one tight turn that would not allow an LMSR or an FSS to reach the port. Also, draft is an issue. The draft is only 10 meters. A draft of 11.5 or greater is desired.[34]

Varna was not developed as a serious COA because it paled in comparison to the port of Burgas. It was taken out of consideration for several reasons. First, as mentioned above, the port had too transient a canal making it difficult for even a medium sized RO/RO to get there. Also, the one tight turn in the channel that eliminates the use of a large military vessel. Another reason, detailed analysis of Varna was not done was that LSA was an issue. The Bulgarian military hotel complex that was offered for use to KFOR personnel was too far way from Varna West, the port that would have been used if Varna was chosen as the primary COA. Lastly, Varna was very tight on space for helicopter operations.

All other criteria like rail availability, cost, force protection, force structure, and time/distance were nearly the same as Burgas. Because of the deficiencies noted in the above paragraph,

Varna was eliminated as a choice. If in the future another Black Sea port was needed to support operations in Kosovo and Macedonia, Varna will be more closely examined.

Evaluation Criteria

Each of the COAs will be examined by the same evaluation criteria. The criteria used to examine the COAs were derived from the facts and assumptions bearing on the problem. Also, they were criteria deemed important by the CG USAREUR and the CG of the 21st TSC. During the evaluation of the different ports the criteria changed. I will first explain the original criteria used to examine the COAs in order of importance. The order of importance was based on guidance from the CG of the 21st TSC with input from the CG USAREUR. Then I will describe the changes made to the evaluation criteria.

The original evaluation criteria that each COA was evaluated against were, in order of importance, time/distance, force protection/security, force structure, port infrastructure, railcar availability, life support, host nation support, and finally cost. Each evaluation criteria will be described in the same way. First, I will define the criteria. Second, a unit of measure will be assigned to each criterion. Thirdly, a benchmark is assigned. Basically, the benchmark is a goal for each of the criteria to meet. Lastly, a formula is given for each criterion. The formula describes how to interpret the data. The formula will state whether a lower number or higher number is more desirable. I will now explain in more detail each evaluation criteria in order of importance.

Time/Distance

This evaluation criteria is defined by how long it takes for equipment to reach its destination of Camp Able Sentry, Macedonia from the SPOE of Charleston, SC. It includes both the SLOC

and the GLOC. It also includes two days to offload the ship, one day to upload onto rail if necessary, and four hours for each border crossing. Historical transit values were used. The unit of measure for these criteria is number of days. The benchmark is 18.5 days. The formula is fewer days are better.[35]

Force Protection/Security

This evaluation criterion is defined as the ability to protect the force and equipment from outside threats (FIS, terrorism, and crime). The unit of measure is a segregated, guarded entry controlled area to store equipment and conduct operations. The benchmark is both units of measure are satisfied. The formula for this criteria is it is advantageous if the COA meets segregated, guarded, and entry control criteria. It is disadvantageous if the COA does not.[36]

Railcar Availability

This evaluation criteria is defined as the correct types and number of railcars that a host nation is able to provide or procure to onward move the equipment form the port. The unit of measure is one train measuring 500 meters, 1,200 tons. The benchmark is 50 trains worth of railcars. The formula is more railcars are better.[37]

Port Infrastructure

This criterion is defined as the ability of the port to handle containers, rolling stock equipment, staging, and the availability of MHE/CHE. The unit of measure is throughput capability by piece the port can process per day. The benchmark is 150 pieces of equipment/cargo per day. The formula is more is better.[38]

Force Structure

Force structure is defined as the number of personnel required to conduct a safe and timely RSO operation. The unit of measure is the minimum number of personnel required to accomplish all missions. The benchmark is 50 personnel. The formula is less is better.[39]

Life Support

The definition of life support is the ability to provide safe life support for U.S. Forces. The unit of measure is 50 soldiers for one month. The benchmark is a facility with 50 rooms collocated with messing/support within 10 miles of the port. The formula is more rooms are better.[40]

Host Nation Support

This evaluation criterion is defined as the ability of the host nation governmental or commercial activity to augment the capabilities either with personnel, services or equipment. The unit of measure is the percent of host nation support required. The benchmark is 90%. More host nation support is better.[41]

Cost

Cost is defined as the total cost of shipping, establishing an RSO site, and the cost of onward moving the equipment from the port. The unit of measure is U.S. dollars. Benchmark is $15,000,000. The formula is less cost is better.[42]

Criteria Weighting Rational-1st Set

The criteria were assigned weights as per the guidance of the commander general of the 21st TSC. They were given numerical values in the Decision Matrix (DECMAT) program based on his judgement as to there importance to the operation.

For the first Set of evaluation criteria, time was deemed the most important criteria followed closely by force protection and railcar evaluation. Force structure and port infrastructure were important factors however not as influential in determining what port to use for this operation. Life support, host nation support, and cost were deemed the least important criteria by the CG of the 21st TSC.

COA Analysis

Based on the above criteria, I will now analyze the advantages and disadvantages of the COAs. Because Varna had so many deficiencies I will not examine that port.

Bremerhaven

The advantages of Bremerhaven are many. First, it is the best COA for force protection being located in Germany. Second, it can easily support all requirements for railcars since the DB is also located in Germany. Thirdly, it is by far the best port. It can easily support two simultaneous LMSRs' operations and has been a proven port for U.S. Forces in Europe for 50 years. It requires the least amount of soldiers to run the operations therefore it is the best COA as far as force structure, life support, and host nation criteria are concerned.

The disadvantages of using Bremerhaven are it is the furthest port away from Kosovo. It would require 21 days to reach the port, second worst only to Constantza for the criteria of time. Also, it is the most expensive port to operate costing $15,477,940.

Thessaloniki

One of the biggest advantages to using Thessaloniki is it takes the least amount of time to reach Kosovo than any other COA. It takes only 18.5 days from Charleston to Camp Able

Sentry, Macedonia. It is also the least expensive port to use costing only $10,345,812. The port facilities are good at Thessaloniki and the life support for the RSO task force is adequate.

The disadvantages of using Thessaloniki are the high threat of terrorism. Force protection is a huge concern in Greece. The Greek government does not allow U.S. soldiers to carry weapons making them nearly indefensible. The Greek government does supply police force for protection but it is uncertain that they will protect U.S. service members from angry rioters. Also, commercial operations can not be segregated from military operations therefore increasing the threat to personnel and increasing the threat of theft/pilferage to equipment and cargo. Because of these issues the force structure of the RSO task force is the largest of any of the COAs. Therefore the life support necessary to support the large task force is the largest, too. Lastly, host nation support received from Greece has not been ideal as mentioned earlier in the description of Thessaloniki.

Burgas

The advantages of using Burgas are numerous. It is nearly as safe, force protection wise, as Bremerhaven. Also, commercial operations at the port can be segregated from military operations providing more security to the operation. The port facility is adequate for the KFOR rotation and the force structure required for the operation is small, giving way to smaller life support requirements. The life support that is required is excellence. The military hotel complex provided by the Bulgarian government is an excellent facility to house the RSO task force. The host nation support provided by the Bulgarian government is excellence, also which was proven in Radomir and when it established the national Logistic Coordination Center in 1999. Lastly, the cost is the lowest second only to Thessaloniki.

There are some disadvantages to using Burgas. Railcar availability, the primary means of onward movement to U.S. camps in Macedonia and Kosovo, is not good. Railcars are required from the German DB. Also, the port cannot accommodate a large vessel such as an LMSR or an FSS. Time/distance is about average per the COA. It takes about 19.5 days to reach Camps in Macedonia from Charleston, SC.

Constantza

Constantza is the largest port on the Black Sea and can berth and operate vessels as large as LMSRs and FSSs. That is its biggest advantage. Also, it is assessed as being nearly as safe, force protection wise, as Bremerhaven. Constantza has an excellent rail infrastructure at the port containing both side and end load ramps for easy on and off load of railcars.

Disadvantages of using Constantza are many. It takes the longest time of any COA to reach the U.S. camps in Macedonia and Kosovo, 21.5 days. Also, it is a very busy port making it difficult to separate military and commercial port operations. Host nation support has not been historically good in Romania. 1st TMCA has had difficult time dealing with several departments of the government. Also their tendencies to nickel and dime NATO forces increases costs.

COA Comparison

Each COA ranks differently in comparison to each criterion. I will now rank order each COA by evaluation criteria.

1st Set of Evaluation Criteria Comparison

Courses of Action	Time	Force Protection	Railcars	Port Infrastructure	Force Structure	Life Support	Host Nation Support	Cost
Bremerhaven	21 days	Low threat for crime and terrorism	Excellent, the best COA for rail operations	World-class, high volume port, can handle 2 LMSRs	Smallest force requirement	Small TF reguires least life support	Outstanding, Primary European port used by U.S.	$15,455,940
Burgas	19.5 days	Nearly safe as Bremerhaven, low crime	Connects to national rail network but limited railcars in country, also no end ramp for loading and unloading	Reliable, med-high volume, med RO/RO port	Medium force requirement, approximately 70	Medium TF requires less life support	Outstanding for operations at Radomir and for planning at Burgas	$11,376,300
Thessaloniki	18.5 days	high terrorism and crime threat	Worst COA for rail operations, rail not a viable option for this COA	Reliable, med-high volume, LMSR port	Largest force requirement, approximately 150	Large TF requires the most life support	Good except for unexpected blackouts delaying ops	$10,345,812
Constanza	21.5 days	Low terrorist threat, but medium threat of crime	Slightly better than Burgas because it has both side and end load ramps	Largest Black Sea port, high volume, LMSR port	Medium force requirement, slightly larger than Burgas	Medium TF requires less life support	Not good, 1st TMCA has had problems in past	$12,000,000 (approximate)

Table 1 -1st Criteria Raw Data Matrix

For time/distance criteria Thessaloniki is the best choice with 18.5 days. Thessaloniki is followed in order by Burgas (19.5 days), Bremerhaven (21 days), then finally Constantza (21.5 days).

Bremerhaven is the best COA for force protection reasons. It is followed closely by Burgas, then Constantza. Thessaloniki is the worst COA for the force protection evaluation criteria.

For railcar availability Bremerhaven is number one followed by Constantza, Burgas, and finally Thessaloniki.

For the evaluation criteria of Port Infrastructure, Bremerhaven is the best port. Thessaloniki is the next best port. Constantza, being the largest Black Sea port, comes in ahead of Burgas, the worst COA for this criterion.

Force structure wise, Bremerhaven again is the best choice. Burgas is the next best COA followed by Constantza, and finally Thessaloniki. Life support is closely linked with force structure, therefore the ranking is the same.

For the evaluation criteria of Host Nation Support, Bremerhaven, again, come in number one. It is followed closely by Burgas, then Constantza, and finally Thessaloniki, the worst COA for host nation support.

The final evaluation criterion for the first set of criteria is cost. Thessaloniki is the best COA for this criterion followed by Burgas, Constantza, and finally the most expensive COA, Bremerhaven.

2nd Set of Evaluation Criteria

As mentioned earlier, some of the evaluation criteria changed during the course of action development. Some criteria were eliminated and the importance of the criteria changed as per the guidance of not only the CG of 21st TSC, but also through the guidance of the CG of USAREUR.

The two criteria that were eliminated were time/distance and railcar availability. Time/distance was eliminated because all the COAs were within a few days of each other making it a less important issue. Railcar availability was eliminated because the German DB promised to support the operation by sending all required railcars to any of the COAs that is chosen. This could be an issue in the future and I will expound upon that in chapter five.

The two evaluation criteria that were added were theater engagement and helicopter operations. I will briefly explain each of these new criteria.

Theater Engagement

Theater engagement is defined as how does the use of a certain port support the CINC's theater engagement strategy? The unit of measure is whether the port used is in a NATO or non-NATO country and if the port has ever been used before for military operations. The benchmark

is a port in a non-NATO country and a port not previously used by U.S. Forces. The formula is non-NATO is better.[43]

Helicopter Operations

The other new criterion is helicopter operations. This evaluation criterion is defined by the ability of helicopters to be preserved/depreserved at the port or in close proximity to the port. The unit of measure is size of staging area, location of nearest airfield, and how far a flight it is from the port to the final destination. No benchmark has been given for this criterion but the formula is basically the more units of measure the COA has, the better.[44]

Criteria Weighting Rational-2nd Set

Through the new guidance from the commanders at both the 21st TSC and USAREUR level the relative importance of each criteria changed. With the introduction of the new criteria and the elimination of two old criteria, force protection became the most important criteria. Cost, life support, and theater engagement were deemed not as important as force protection but still crucial to the evaluation of each COA. Force structure and helicopter operations were not as influential in determining which port to select, therefore were given a lesser weight than the previously mentioned criteria. Lastly, port infrastructure and host nation support were seen as the least important criteria and were weighted accordingly. However, port infrastructure was seen as more important than host nation support.

COA Comparison with New Criteria

With the introduction of the new evaluation criteria the COA must be reevaluated according to the new criteria.

2nd Set of Evaluation Criteria Comparison

Courses of Action	Force Protection	Cost	Life Support	Theater Engagement	Force Structure	Helo Support	Port Infrastructure	Host Nation Support
Bremerhaven	Low threat for crime and terrorism	$15,455,940	Small TF reguires least life support	Does not enhance theater engagement, NATO member	Smallest force requirement	Worst COA for helicopters	World-class, high volume port, can handle 2 LMSRs	Outstanding, Primary European port used by U.S.
Burgas	Safe as Bremerhaven, low crime	$11,376,300	Medium TF requires less life support	Enhances theater enhancement, not a NATO member	Medium force requirement, approximately 70	Untested, but has potential	Reliable, med-high volume, med RO/RO port	Outstanding for operations at Radomir and for planning at Burgas
Thessaloniki	high terrorism and crime threat	$10,345,812	Large TF requires the most life support	Increased theater presence, NATO member	Largest force requirement, approximately 150	Best COA for helicopters	Reliable, med-high volume, LMSR port	Good except for unexpected blackouts delaying ops
Constanza	Low terrorist threat, but medium threat of crime	$12,000,000	Medium TF requires less life support	Increased theater presence, NATO member	Medium force requirement, slightly larger than Burgas	As bad as Bremerhaven	Largest Black Sea port, high volume, LMSR port	Not good, 1st TMCA has had problems in past

Table 2 –2nd Criteria Raw Data Matrix

The COAs are vastly different when comparing them with the new evaluation criteria. First, with theater engagement, Burgas and Constantza are tied as the best COAs because neither Bulgaria nor Romania is a NATO nation and U.S. forces have previously used neither of the ports. Thessaloniki comes in third. Even though Greece is a NATO nation and has been used it does increase our presence in the Mediterranean Region. Bremerhaven comes in last because Germany is a NATO nation and U.S. forces have used this port for 50 years.

When comparing the COAs using helicopter support as a criterion, Thessaloniki comes out on top because of its adequate facilities and its close proximity to Macedonia/Kosovo. Burgas is the next best COA, having great facilities and needing only one refueling stop to reach destination. Constantza is third followed by Bremerhaven being the worst COA for helicopters.

Decision Matrix

The way I will compare these courses of action is through the use of a decision matrix program called DECMAT. This program provides for a mathematical answer that reduces subjectiveness and biases giving way to a more accurate answer to the problem at hand.

1st Set of Evaluation Criteria

DECISION MATRIX — 1st Eval Criteria

Weight	7.44	5.15	4.85	3.52	2.56	1.80	1.27	1.00	Total
Criteria / COA	Time	Force Protection	Railcars	Port Infrastructure	Force Structure	Life Support	Host Nation Support	Cost	
Bremerhaven	3	1	1	1	1	1	1	4	45.470
Burgas	2	2	3	4	2	2	2	2	67.069
Thessaloniki	1	4	4	2	4	4	3	1	76.731
Constantza	4	3	2	3	3	3	4	3	86.632

Relative Values Matrix
Less is better
Consistency Ratio = 96.64

Table 3-1st Criteria DECMAT

As seen in the above decision matrix, Bremerhaven is the clear choice if using the first set of evaluation criteria. Some of the primary reasons it is the best choice are it is the safest port to use and railcar availability is the best. Also, it has the best port infrastructure and its location in Germany makes the task force required very small and thus the life support necessary to support that force small also.

2nd Set of Evaluation Criteria

DECISION MATRIX — 2nd Eval Criteria

Weight	7.44	5.15	4.85	3.52	2.56	1.80	1.27	1.00	Total
Criteria / COA	Force Protection	Cost	Life Support	Theater Engagement	Force Structure	Helo Support	Port Infrastructure	Host Nation Support	
Bremerhaven	1	4	1	4	1	4	1	1	59.012
Burgas	2	2	2	1.5	2	2	4	2	55.954
Thessaloniki	4	1	4	3	4	1	2	3	82.446
Constantza	3	3	3	1.5	3	3	3	4	78.488

Relative Values Matrix
Less is better
Consistency Ratio = 96.64

Table 4-2nd Criteria DECMAT

With the new set of evaluation criteria Burgas narrowly beats out Bremerhaven as the number one choice. It becomes the optimal solution because it consistently ranks second in almost all the categories whereas the other courses of action vary greatly when comparing them to the new criteria.

V. RECOMMENDATION AND CONCLUSION

Recommendation

The recommendation for the optimal deployment and redeployment of Army Forces supporting operations in Kosovo is using the port of Burgas, Bulgaria as the port of entry and exit into the region. This is supported by the second decision matrix. Since the second set of criteria in that decision matrix is a result of the new guidance from the CGs of both USAREUR and 21st TSC the recommendation that resulted from those criteria is the best COA.

Admittedly, there are flaws with this process that could have led to inaccuracies. First, the port of Varna, Bulgaria was eliminated. If the decision making process was used in its purest form throughout this analysis, no COA could be eliminated unless it failed to meet certain screening criteria. There were no screening criteria used in this decision, only evaluation criteria. Therefore, Varna was wrongly eliminated. Granted it did not measure up to the other COAs in almost all of the evaluation criteria, but if something would happen to the other COAs making them unavailable for use, no detailed analysis of Varna took place to see if it would work for this mission.

Certain current events were not entered into this equation, namely, the civil war in Macedonia. That conflict could also affect the use of Thessaloniki because if that COA was chosen U.S. Forces would be road marching directly through the war torn region.[45]

Another important issue that I do not believe was taken into enough consideration was the potential for theft and damage when using trains. When British Forces used rail for getting equipment and supplies to Kosovo they experienced extensive damage to their equipment. [46]

This is a big issue especially if Bremerhaven was chosen as the port. There are so many border crossings between Germany and Kosovo where the train comes to a halt while locomotives are switched there are ample opportunities for criminals to get at the equipment. Military police have been used to guard certain crossings but there are not enough military police to guard every one.

Another problem that was not entered into the equation was the initial inability of MSC to get a tender for a ship for any of the Black Sea ports.[47] Although, they were able to solve this problem it could be a problem in the future because the limited amount of traffic the Black Sea has compared to the other major European ports like Bremerhaven and Thessaloniki.

Another possibility that would change the outcome of the decision would be the availability of rail routes through Serbia. 1st TMCA has looked into that as an option. If rail routes through Serbia were available trains from Germany would only have to go through Austria, Hungary, Serbia, then into Kosovo. This would reduced total travel time considerably and reduced the number of border crossings, which translates into less chance for theft and vandalism.[48]

Lastly, relative values were used when comparing the COAs because not every evaluation criteria had a numerical value. If a numeric value could have been assigned to each evaluation criteria then a multiplication matrix could have been used. A multiplication matrix is a more accurate way to compare the COAs. For example, for the criteria of time/distance, instead of ranking them 1, 2, 3, and 4, you would rank them exactly the number of days it took to reach destination from that particular COA. If the multiplication matrix could have been used, the decision matrix would have yielded a more accurate solution.

Although these issues have an impact of the decision making process, I do not believe they would have changed the outcome. I still believe that Burgas is the best COA given the second set of evaluation criteria.

Conclusion

As stated in the recommendation, the optimal solution for deployment and redeployment Army Forces supporting operations in Kosovo is using Burgas, Bulgaria as the primary port. My goal was to not only solve the problem of Kosovo, but to develop a tool that other commanders could use when they are being tasked to move units to a certain area of responsibility. As you could see in chapter four, when the evaluation criteria changed and the relative importance of the criteria changed a different port was chosen as the best COA. That showed the flexibility of this deployment decision tool. It showed that as the environment changed, and thus the importance of certain criteria, the decision matrix was easily altered.

Another great aspect of this tool is how it numerically ranks order the COAs. Therefore, if Burgas was eliminated because of a storm or terrorist attack, there is no need to recompute the data. One only has to look at the next best surviving COA. In this case it would have been Bremerhaven.

As the Army becomes a more lighter and leaner force, able to deploy and project its power throughout the world at a moments notice, it is necessary to have a deployment decision tool. This tool will assist commanders and their staffs in deciding how to deploy and what avenues of approach should be used to safely and quickly reach the desired destination. This tool is flexible and easy to use. It eliminates subjective opinions and provides an objective answer. The 21st TSC faced enormous opposition from TRANSCOM and MTMC when they began looking into

Black Sea ports.[49] The opinion of TRANSCOM and MTMC was if Thessaloniki worked in the past why look elsewhere? Also, 21st TSC's opinion was the easiest port to use is Bremerhaven because a task force isn't required to run the port. A task force of some size is needed to run all the other ports being considered. All of these opinions were put aside and replace with facts that bear on the problem and assumptions that were derived from those facts. From those facts and assumptions evaluation criteria were developed and ranked in level of importance. This provided for a clear, objective solution to the problem.

This technique, if used correctly will provide for an unbiased solution to any problem applied to it. If used correctly, it will be an invaluable tool for military leaders who are directed to make deployment decisions in this rapidly changing military environment.

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14. ABSTRACT

The Army of today is being asked to deploy allover the world. The missions that the soldiers are asked to do are as diverse as the locations they deployed to. In the future, as the Army becomes a more lighter and leaner force, it will be asked to go more places and on shorter notices. However, it will be asked to deploy with the same level of lethality it did when it was a larger more robust force. Commanders need tools when asked to deploy forces. They need help when deciding quickly how to get their forces to the fight.

This thesis develops such a tool and applies it to operations in Kosovo. It provides a solution to the problem of what is the optimal European port to use when deploying forces to Kosovo. The tool use is an objective method that cancels out biases with facts and assumptions that pertain to the problem. It examines each course of action by comparing them to evaluation criteria. The criteria are derived from guidance from the Commanding General of both U.S. Army Europe and the 21 st Theater Support Command.

The result of this study shows that Burgas, Bulgaria is the best course of action for deploying forces to Kosovo. It also explains that other factors that were not included in the study could have had an effect on the final recommendation. Overall, this study provides an unbiased answer to the question of which port to use for deploying forces to Kosovo and provides commanders a tool that will assist them when deploying forces in the future.

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